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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/567,072	02/03/2006	Cheol-Min Kim	50413/011001	2285

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CLARK & ELBING LLP
101 FEDERAL STREET
BOSTON, MA 02110

EXAMINER	
SHAW, AMANDA MARIE	
ART UNIT	PAPER NUMBER
1634	

NOTIFICATION DATE	DELIVERY MODE
06/13/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentadministrator@clarkelbing.com

Office Action Summary	Application No.	Applicant(s)	
	10/567,072	KIM ET AL.	
	Examiner	Art Unit	
	AMANDA SHAW	1634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 April 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,7,8,10-12 and 14* is/are pending in the application.

4a) Of the above claim(s) *14* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3, 7-8, 10-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *03 February 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Applicant's election without traverse of Group I (claims 1-3, 6-12, and 16-18) in the reply filed on April 7, 2008 is acknowledged.

Claim 14 is withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected subject matter, there being no allowable generic or linking claim.

Claim Rejections - 35 USC § 112 2nd paragraph

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 7-8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 7-8 are indefinite over the recitation of the phrase "probes for detecting the presence and raito of more than one type". This phrase in considered indefinite because it is unclear what is being detected or in other words what "more than one type" refers to.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

As noted in the MPEP 211.02, " a preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone." Further, in *Pitney Bowes Inc. v. Hewlett-Packard Co.*, 182F.3d 1298, 1305, 51 USPQ2d 1161, 1166 (Fed Cir. 1999) the court held that if the body of the claim sets forth the complete invention, and the preamble is not necessary to give "life, meaning and vitality" to the claim, "then the preamble is of no significance to claim construction because it cannot be said to constitute or explain a claim limitation." In the present situation, the structural limitations of the oligonucleotides present on the microarray are able to stand alone and the preamble limitation is not accorded patentable weight. Accordingly, the claim language of "a microarray with target probes for detecting drug resistant HBV on a support" merely sets forth the intended use of the microarray, but does not limit the scope of the claims.

4. Claims 1-3 and 7-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Fodor (US 2001/0053519 Pub 12/2001).

Regarding Claim 1 Fodor teaches an array comprising all possible nucleic acid sequences of any given length. For example a 10-mer array comprises all possible oligonucleotides containing 10 base positions (Col 17, lines 23-36). While Fodor does not specifically discuss probes for detecting point mutations at codons 528, 529, and 514 of domain B and at codons 552, 548, and 555 of domain C of the HBV DNA

polymerase gene, it is a property of the array taught by Fodor that it would comprise probes capable of detecting these point mutations. In view of the comprising language in the claim the claimed microarray is not limited to probes that only detect these mutations.

Regarding Claim 2 Fodor teaches a microarray on a support wherein the support is a gel (Col 2, lines 34-35).

Regarding Claim 3 Fodor teaches that the probes are oligonucleotides (abstract).

Regarding Claims 7-8 it is inherent that the microarray of Fodor would comprise negative control probes that have been prepared by substituting, inserting, or deleting at least one nucleotide sequence among the nucleotide sequences of the target probes not to be hybridized with a target product.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation

under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

As noted in the MPEP 211.02, " a preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone." In the present situation, the structural limitations of the oligonucleotides present on the microarray are able to stand alone and the preamble limitation is not accorded patentable weight. Accordingly, the claim language of "a microarray with target probes for detecting drug resistant HBV on a support" merely sets forth the intended use of the microarray, but does not limit the scope of the claims.

6. Claims 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fodor (US 2001/0053519 Pub 12/2001) in view of Kincaid (US 2003/0186310 Filed 4/2003)

The teachings of Fodor are presented above.

Regarding Claim 10 Fodor does not teach a microarray further comprising quality control probes labeled with a fluorescent material having a different excitation/emission wavelength from a fluorescent material used to label the target product. Regarding Claim 11 Fodor does not teach quality control probes that have arbitrary sequences that

have at least one nucleotide labeled with a fluorescent material. Regarding Claim 12 Fodor does not teach that the quality control probes is labeled with Cyanine 3 or Cyanine 5.

However Kincaid teaches control probes on a microarray. The control probes can be any known sequence of nucleic acid as long as they do not interfere with the hybridization of the target sample. Kincaid further teaches that the control probes are labeled with a fluorescent material that emits a signal that is distinguishable from any other signal that may be used on the array (para 0016). An example of a label that can be used is CY3 and CY5 (para 0076).

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the microarray of Fodor by adding control probes as suggested by Kincaid. The use of control probes were conventional in the field of molecular biology at the time the invention was made and provide the advantage of allowing one to be able to monitor hybridization to determine if the probes on the microarray are working.

7. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vernet (Virus Research 2002) in view of Liu (Antiviral Chemistry and Chemotherapy 2002).

Regarding Claim 1 Vernet teaches that one potential application of DNA Chip technology is in the field of clinical virology and diagnostics, as, for example genotypic resistance tests (page 69). Vernet further teaches that resistance mutations in the

genome of HBV have been described in response to antiviral therapies (pages 70). Regarding Claim 2 Vernet teaches a microarray on a support wherein the support is glass or silica (page 65). Regarding Claim 3 Vernet teaches that the probes are oligonucleotides (page 65).

Vernet does not disclose probes for detecting point mutations at codons 528, 529, and 514 of domain B and at codons 552, 548, and 555 of domain C of the HBV DNA polymerase gene.

However Liu teaches that the point mutations at codons 528, 529, and 514 of domain B and at codons 552, 548, and 555 of domain C of the HBV DNA polymerase gene were well known in the art (see Table 2). Liu further teaches that the point mutations have been reported as drug resistant mutations. While Liu does not teach probes specific for each of these point mutations, it was well known in the art at the time the invention that probes designed for a specific mutation could be used in order to detect that mutation. Designing such probes is considered routine experimentation. Further the parameters and objectives involved in desinging these probes were known. Thus the prior art is replete with guidance and information necessary to permit the ordinary artisan to design probes for the detection of the recited point mutations. Further, using the computer programs available an ordinary artisan would have had more than a reasonable expectation of success of making probes for detecting these mutations. Additionally one would have been motivated to put these probes onto a microarray for the benefit of being able to detect the presence or absence of these mutations using microarray technology that overcomes the low sensitivity, the high cost

and the long time result of existing tests based on culture and direct or indirect immunoassay detection (Vernet page 70).

8. Claims 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vernet (Virus Research 2002) in view of Liu (Antiviral Chemistry and Chemotherapy 2002) as applied to claim 1 and in further view of Anderson (US 2003/0040870 Pub 2/2003)

The teachings of Vernet and Liu are presented above.

Regarding Claims 7-8 the combined references does not teach a microarray further comprising negative control probes that have been prepared by substituting, inserting, or deleting at least one nucleotide sequence among the nucleotide sequences of the target probes not to be hybridized with a target product.

However Anderson teaches negative control probes. For single base changes (such as a SNP) one probe was made to be the complement of the wild type sequence, one probe was made to be the complement of the mutated sequence, and one probe was made to be the complement of a different mutation (para 0064). Thus Anderson teaches negative control probes that have been prepared by substituting, inserting, or deleting at least one nucleotide sequence among the nucleotide sequences of the target probes not to be hybridized with a target product.

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the microarray of Vernet and Liu by adding negative control probes as suggested by Anderson. The use of control probes

were conventional in the field of molecular biology at the time the invention was made and provide the advantage of allowing one to be able to monitor hybridization to determine if the probes on the microarray are working.

9. Claims 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vernet (Virus Research 2002) in view of Liu (Antiviral Chemistry and Chemotherapy 2002) as applied to claim 1 and in further view of Kincaid (US 2003/0186310 Filed 4/2003).

The teachings of Vernet and Liu are presented above.

The combined references do not teach a microarray further comprising quality control probes labeled with a fluorescent material having a different excitation/emission wavelength from a fluorescent material used to label the target product. Regarding Claim 11 combined references do not teach quality control probes that have arbitrary sequences that have at least one nucleotide labeled with a fluorescent material. Regarding Claim 12 combined references do not teach that the quality control probes is labeled with Cyanine 3 or Cyanine 5.

However Kincaid teaches control probes on a microarray. The control probes can be any known sequence of nucleic acid as long as they do not interfere with the hybridization of the target sample. Kincaid further teaches that the control probes are labeled with a fluorescent material that emits a signal that is distinguishable from any other signal that may be used on the array (para 0016). An example of a label that can be used is CY3 and CY5 (para 0076).

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the microarray of Vernet and Liu by adding control probes as suggested by Kincaid. The use of control probes were conventional in the field of molecular biology at the time the invention was made and provide the advantage of allowing one to be able to monitor hybridization to determine if the probes on the microarray are working.

Conclusion

10. No Claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AMANDA SHAW whose telephone number is (571)272-8668. The examiner can normally be reached on Mon-Fri 7:30 TO 4:30. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ram Shukla can be reached at 571-272-0735. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Amanda M. Shaw
Examiner
Art Unit 1634

/Juliet C Switzer/

Primary Examiner, Art Unit 1634